

Orme (H. S.)

THE
CLIMATE OF SOUTHERN CALIFORNIA.

BY
H. S. ORME, M.D.,
PRESIDENT CALIFORNIA STATE BOARD OF HEALTH; EX-PRESIDENT OF THE MEDICAL
SOCIETY OF THE STATE OF CALIFORNIA.

REPRINTED FROM THE
TRANSACTIONS OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION,
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By climate we ordinarily mean the conditions of a place with reference to heat and moisture. To the physician, however, the term is much more comprehensive. It includes not only the question of heat and moisture, but a consideration of all the physical features that surround a locality, and which in any way affect it as a place of habitation. It embraces, therefore, in addition, the problems of topography, soil, water-supply, sanitary conditions, and social surroundings—everything, in fact, that is conducive either to sickness or to health.

In discussing the various natural phenomena which go to make up the climate of Southern California, we shall consider the following topics:

Position with reference to prevailing winds.

Topography.

Drainage and water-supply.

Soil.

Temperature.

Prevailing winds.

Humidity and rainfall.

Social surroundings.

POSITION WITH REFERENCE TO PREVAILING WINDS.

An inspection of a good physical map of the world will show that there are two great agents which transfer both heat and moisture from tropical to temperate latitudes, namely, winds and ocean currents. In the temperate zones the general direction both of the winds and the ocean currents, is from west to east. These currents start from moist tropical regions, and are diverted toward the higher latitudes of the temperate zones. Not only do they warm the land upon which they strike, by their higher temperature, but they also transfer a vast

amount of latent heat from tropical to temperate regions. These winds are loaded down with the moisture taken by evaporation from the tropical ocean, and when the moisture is precipitated on the western slopes of the continents all of the latent heat is set free, and is carried far inland.

It follows, then, that the western coasts of the continents receive a vastly greater amount of heat than do the eastern coasts situated in the same latitude of the temperate zones. Furthermore, this extra supply of heat is distributed in the winter season, at a time when it will be most appreciated. Thus we find that Sitka, Alaska, is about as warm in winter as the city of Washington, about eighteen degrees further south; while Labrador, situated in about the same latitude as Alaska, is an inhospitable region, shrouded in ice and snow during the greater part of the year. An equally striking case is the city of Los Angeles, which, situated seven degrees south of St. Paul, Minnesota, has a mean summer temperature six degrees lower. We may, therefore, expect to find on the western coasts of the temperate zones not only warmer winters, but cooler summers, than in places of corresponding latitude situated inland, or on eastern coasts.

CLIMATIC POSITION OF CALIFORNIA.

The position of California is such that it receives the full benefit of all those conditions favorable to a mild oceanic climate. It faces the warm and moist winds of the Pacific both in winter and summer. The warm waters of the Kuro Siwo are swept down the coast, bathing the shores with water that is rarely cooler than 60° , nor warmer than 70° .

This State has a coast line which, including San Francisco Bay and its inlets, is nearly one thousand miles in length. Its most western point is in longitude $124^{\circ} 30'$; its northern boundary is the forty-second parallel. It extends through about ten degrees each of latitude and longitude. Two ranges of mountains traverse the State from northwest to southwest. The more westerly of these, the Coast Range, consists of several low and parallel ranges of mountains or hills lying next to the ocean, and giving contour to the coast. The easterly highland is the Sierra Nevada Mountains. This lofty range is the western rim of the immense highland basin—nearly one thousand miles in breadth—which separates the region commonly known as the "States" from the "Coast." This chain of mountains forms a lofty barrier which for nearly a thousand miles has no pass less than five thousand feet in

height, save where the Sacramento, Klamath, and Columbia rivers have worn their deep gorges through its rocky fastnesses.

To this stupendous mountain chain is due much of the genial influence of the climate which characterizes the Pacific coast. Its high crest, wrapped in a mantel of perpetual snow, wrests the moisture from the warm ocean winds, and turns it back in a thousand rills, rivulets, creeks, and mountain torrents, into the broad valley through which the San Joaquin and Sacramento rivers pour their flood.

Toward the southern part of the State the Coast Range of mountains turns sharply to the east and approaches the great chain of the Sierra Nevada. Near the northern boundary of Los Angeles County the Tehachapi Mountains rise abruptly from the San Joaquin Plain, and, extending nearly east and west, connect the two mountain chains which give to California its contour and outline. South of the crest of the Tehachapi Mountains lies the region commonly known as Southern California.

TOPOGRAPHY.

The territory included under this name is, in itself, a totally distinct physical region. Its fauna and flora have much in common with that of the rest of California, but they also present many wide differences. Its topography changes; its climate is milder and moister, and its flora becomes more varied. The treeless plain of the San Joaquin, with its everlasting border of willows and tule swamps, gives place to palms and yuccas. The micaceous sediment which is the prevailing soil of Central California, changes abruptly to the gravelly loam of Southern California—in fact, there would be no greater change if one at a single step should clear six or eight degrees of latitude. North of the Tehachapi summit, climate, verdure, and products are those of temperate regions; south of this crest they are semi-tropical.

Politically Southern California consists of the counties of Santa Barbara, Ventura, San Bernardino, Los Angeles, and San Diego. They form an irregular rhombus or lozenge in shape, extending from latitude $32^{\circ} 30'$ to $35^{\circ} 40'$. The coast line has a southeasterly trend, and, including its indentations, has a sweep of about three hundred and thirty miles. Much of the coast of Los Angeles County, and nearly all of Santa Barbara County, presents a southerly exposure. Four of the five counties border on the sea—one only, San Bernardino County, is wholly inland.

The western part of this region is traversed by the Coast Range and its outlying spurs. They inclose a number of beautiful valleys, with

soil of wonderful fertility. Some of them are settled; all of them are capable of supporting a dense population. The elevation of this region varies from the sea level to 11,800 feet.

The eastern part is situated in the physical region known as the Great Basin. The crest of the Sierra Nevada Mountains divides its waters from those of the Pacific Slope. Some of its ephemeral streams reach the Colorado River, and, during a cloud burst, pour a torrent of water into its turbulent flood. For the greater part, however, none of these streams ever reach tide-water. They flow into "sinks," or spread out upon the desert until their waters evaporate under a burning, tropical sun. This region is commonly known as the Mojave Desert; a small area in the southern part, separated from the former by a low and isolated ridge, is called the Colorado Desert. The greater part of this desert region has an altitude of from one thousand to three thousand feet above the sea. There are, however, several remarkable depressions. Two of them, Death Valley, or the Arroyo del Muerto, and the Sink of the San Felipe, are about four hundred feet below the level of the ocean.

The trains of the Southern Pacific Railway, after climbing over San Gorgonio Pass, descend into it, and cross the latter depression at a grade of two hundred and sixty-one feet below the sea. This vast depression, once an arm of the Gulf of California, was separated from the sea by the same process of ponding that separated the Caspian Sea from the ocean, and made it an inland lake. Its dry bed is covered with incrustations of gypsum, borax, and salt, which remained when the lagoon became a dry bed.¹

But by far the most important part of Southern California is the western slope of the Coast Range, together with the multitude of valleys, great and small, which lie between the ridges of this system of mountains. This area begins as a narrow strip in the north, and widens to a vast plain in the south. Opening into it on the north is the San Fernando Valley; on the east the San Gabriel Valley extends more than sixty miles inland to the rim of the great basin. On the south the Santa Ana and San Joaquin Plains constitute an almost level plain, more than five thousand square miles in area.

This territory comprises an area which, in years to come, will be the most densely settled agricultural region on the Pacific coast. Its soil is unsurpassed in fertility; its climate is more genial than that of

¹ At the present time the New Liverpool Salt Company is reaping a rich harvest by collecting and refining the salt which collected in this lagoon before it was entirely cut off from the sea.

Southern Europe; its productive qualities are equal to those of the famous valley of the Po, which it closely resembles. It will produce almost any crop that can be grown between the Red River of the north and Key West. Even now its hoard of grain is consumed by the overcrowded population of London, while its canned fruits command a premium in the cities of Italy.

DRAINAGE AND WATER-SUPPLY.

The drainage slopes of Southern California are two in number. Those whose sources are west of the rim of the Great Basin are insignificant in size, and are dry washes for the greater part of the year. Occasionally there will be a cloud-burst, and for a few hours these streams will be roaring torrents. There is a single rush of water, and then a bed of dry, white, burning sand indicates merely that water has been there some time or other.

On the western slope there are a multitude of short streams rising in the snows of the high mountain peaks, or fed by winter rains. Every cañon in the mountains is the bed of one of these streams which threads its way to the widening of the valley, where, joining other streams, the combined waters flow oceanward. But few of them reach the sea, however, for the cupidity of man diverts their waters into a thousand channels, and the coarse gravelly soil absorbs the last drop of their flood. But the greater supply of water is derived not directly from the rivers themselves, but from the vast amount of water which, absorbed by the porous sandstone, and the loose soil, forms a subterranean reservoir of water, underlying the greater part of the whole level region.

Anywhere in this plain water may be reached at a depth varying from twenty to one hundred feet. Thousands of artesian wells have been sunk through the pervious soil, and with scarcely an exception, a never-failing supply of water has been reached. In a minority of instances, the water spouts several feet above the surface. More frequently it must be raised to the surface by pumping. The quality of the water thus obtained is excellent. The mineral substances present are chiefly salts of potassium and sodium; the degree of hardness is below that of the average potable water. The smaller towns are usually supplied with water from this source. The larger centres of population more commonly depend on some one or more mountain streams which are piped from their sources and thus conveyed to cemented reservoirs. With the possible exception of the Croton water of New

York City, the water-supply of Southern California is equal to that of eastern cities.

SOIL.

The character of the soil of any region depends mainly on the character of the geological formation of the country. In the Coast Range, and its outlying spurs, the rocks are chiefly sedimentary, and the soil therefore generally consists of the detritus coarsely pulverized. In their bearing on the climate the many varieties of soil may be classified with respect to their retentiveness of moisture.

The non-retentive soils comprise the clays, of which the area is comparatively small. The most common soil of this character is the well-known *adobe*, which occurs in patches varying from a few acres to several square miles in extent. It is of inferior specific gravity, contains a large amount of organic matter, and when mixed with water, swells into an extremely viscous mass. Exposed to the air, under the rays of a hot sun, the clayey soils, and especially the *adobe*, bake to a dry and friable mass. The *adobe* shrinking in bulk as it loses its moisture, breaks into small lumps, which are almost as hard as rock. The soils of this character are always rich in alkaline salts. They often contain such notable qualities that, with the drying out of the soil at the approach of summer, the ground is covered with a thick, white efflorescence of alkaline carbonates, mixed with magnesium sulphate.

The retentive soils comprise the sand belt along the coast, the gravelly loams, the vast plains of sedimentary deposit, and the so-called sandbottoms, formed by the overflow of the streams during the rains. Owing to their capillarity the soils of this class are moist throughout the year, even during the hottest and dryest weather. The secret of their moisture is not hard to find. They are permeated by the substratum of water that underlies the entire plain, and the hottest summer temperature does not cause evaporation to extend more than a few inches below the surface. So wonderfully productive are the sandy soils of this region that three crops of corn may in good season be grown and matured in one year.

The soil of the eastern section, or the arid region known as the Colorado Desert, also the river bottoms of the western slopes, are also classed among the sandy soils. Of real sand, however, there is none. The substance of this detritus is nothing more or less than finely pulverized granite, rich in feldspar and mineral phosphates. Soil of this character cannot be surpassed for the production of fruits, as the rich

flavor of the grapes grown in the bottom lands about Anaheim and Orange will attest.

RAINFALL.

The benefits to be derived from the rainfall depend not so much on the quantity of precipitation as its distribution. A knowledge of the latter reveals much concerning the climatic conditions of a country.

The rainfall of the whole Pacific slope of North America occurs almost wholly during the winter months. The quantity of precipitation varies from about one hundred and twenty inches in Alaska, to about ten inches in San Diego. In Southern California there are a few scattering showers in November and December, but the heavier fall occurs in the three months following. There are occasional showers in April, and rarely in May. In the mountains, however, there are dashes of rain as late as the middle of June. On an average there are from twenty to thirty rainy days in the year. The rainy season of winter means—not a continuous overcast sky with constant precipitations, but—occasional rain storms lasting two or three days each, with long intervals of pleasant sunshine between.¹

In the following table the stations are widely scattered over the northern and southern coast and inland limits of Southern California.

Station.	Position.	Average rainfall.
Santa Barbara,	Northern Coast	16.92
Los Angeles,	Sixteen miles inland	17.95.
San Bernardino,	Sixty miles inland	16.35
San Diego,	Southern Coast	10.82
Fort Yuma, ²	Colorado Desert	2.1

From the foregoing, it will be seen that the western slope receives an average of about sixteen inches of rain per year, while in the arid region the rainfall is insignificant, and as previously mentioned, comes usually in the form of cloud-bursts.

In the arid region wherever water can be obtained for irrigation, vegetation grows with the greatest luxuriance, as may be seen in the case of the railway station at Indio, on the Southern Pacific Railway. Without irrigation, the vegetation of this region is confined to the cactus and agave families, which are here more profusely represented than in any other part of the world.

In general the western slope of Southern California receives about

¹ In Los Angeles, during the year 1884, there were 316 clear or fair, and 50 rainy or cloudy days.

² Fort Yuma, formerly a U. S. Military Station, is in California. Yuma City is just across the Colorado River in Arizona.

as much rain as the Lower Sacramento Valley, considerably less than the western slope of Northern California, and a little more than the San Joaquin Valley. In the fruit-growing region the rainfall is sufficient for all purposes. In the grain-growing districts it is sufficient to produce as much as the soil will stand without wearing out—enough, on the average to mature six crops out of seven.

RELATIVE HUMIDITY.

By the relative humidity of the atmosphere is meant the amount of the vapor of water that the air can contain at a given temperature. Warm air, bulk for bulk, contains much more moisture than cold air. The air to-day which seems damp may to-morrow be dry,¹ and at the same time contain the same amount of moisture. In expressing, therefore, the humidity of a locality the figures usually show, not the weight of the aqueous vapor, but the percentage of the amount required to saturate it completely with moisture. Thus the percentage of sixty means that the atmosphere contains three-fifths of the amount that it is capable of holding. With a relative humidity of thirty-five, which is an average for the summer months at Fort Yuma, the air is exceedingly dry. With a percentage of seventy-three, which fairly represents San Francisco during the winter months, the air is damp, and in cold weather the wind, if it be blowing, has that quality commonly known as chilling. In warm weather it is not oppressive, but it lacks the invigorating qualities which a stiff breeze of mountain air imparts to the system.

On the coast the percentage of humidity varies from sixty-nine to seventy-five during the winter months, and sixty to sixty-eight in summer. Twenty miles inland there is a remarkable decrease in the humidity, and at a distance of one hundred miles inland, the atmosphere becomes very dry, the percentage varying from thirty to fifty.

From the time the first rains fall the belt of country next to the coast is bathed by a tolerably moist atmosphere. At a distance of a few miles inland is a narrow belt in which, owing to lower temperature at night, and also to the great amount of marsh lands, the humidity is somewhat greater. Here heavy fogs prevail, and the deposition of dew is enormous. Beyond this narrow strip the humidity rapidly decreases. After the rains are well over, the dew-fall gradually ceases, and the air becomes uniformly dry. One may camp out of doors, sleeping on

¹ Sacramento figures 19.7 inches; San Francisco 24.11 inches; Stockton 16.7 inches; Visalia 9 inches.

the ground, without danger to the health. There is no decomposition of organic matter, because there are no summer rains. The atmosphere becomes so free from the organic germs of putrefaction that meat cures or "jerks." It dries up, but does not putrefy, and the culture fluids used in cultivating the various species of bacilli and bacteria often remain weeks before breaking down.

This happy condition, however, is not universal. In the low bottom lands, and in localities where irrigation is practised, the air is quite as full of germs as any other locality. In such places the malaria is quite as effective and destructive to health as in the bottom lands of the Mississippi River. But such localities are rare, and may be readily avoided.

The most unpleasant features of the change of season are the fogs. Foggy nights and mornings occur on the average twenty to thirty times during the year. The fog rolls in from the sea through the natural passes and valleys in a manner that menaces a rain storm. It never reaches a thousand feet in height, however, and at a short distance from the coast it is unknown. Like the malarial spots, the fogs may be avoided.

WINDS.

The prevailing winds of the southern coast have the nature of monsoons. The prevailing direction during the summer months is from the north and northwest; in winter from the south and southwest. The direction and strength of the wind are greatly modified by the proximity of the land, however; and as a general rule, local winds assert themselves all over the State.

From Point Conception southward they are especially noticeable, and in this region their cause can be easily explained. During the summer the land in the interior becomes greatly heated, creating a strong up-draught of air. As a result, there is a stiff sea breeze all along the coast, which is apparent to a distance of fifteen to twenty miles inland. It would appear from this that an extremely hot day inland would indicate moderately cool weather along the coast belt—a theory which, moreover, is in perfect accordance with the facts of the case.

Among the local winds of the Pacific coast is one variously known on the north coast as the Chinook, or in the south as the "Norther." In Southern California it is best known as the Santa Ana. It is a hot wind, extremely disagreeable during its prevalence, but is none the less valuable for its health-giving qualities. It is most usually confined to localities of limited extent, but occasionally it sweeps over an area of

several thousand square miles. During its progress the air becomes highly electrified. Horses' tails stick out like thick bushes. The hair of the head crackles sharply when stroked by the hand. Metallic objects resting on an insulating surface, such as dry wood, become condensers and collectors of the electrical fluid, and discharge themselves with visible sparks whenever a conductor is brought near. In one instance the telegraph line between Los Angeles and Tucson, more than four hundred miles long, was detached from the battery, and operated by the earth current alone.

Sometimes the Santa Ana wind is so hot and dry that the leaves wither and fall from the trees. This, however, is of extremely rare occurrence, and in general this wind lasts but a few hours. The pure, invigorating quality of the atmosphere, following the Santa Ana wind, more than counterbalances its disagreeable effects.

TEMPERATURE.

The mild temperature of California, as a whole, is due chiefly to its position with reference to the prevailing ocean winds. In Southern California an additional cause may be found in the low latitude. Lying in the same latitude as South Carolina and Georgia, a mild climate would be the natural result. But the fact that this region is swept by ocean winds gives it a climate which is typically an oceanic climate. This is the secret of its uniformity; it is hardly necessary to add that the temperature is most uniform nearest the ocean, and that the daily rains increase as one leaves the coast and travels toward the interior. This uniformity is shown on comparing the twelve hottest and the twelve coldest days of Santa Barbara during 1886. An average of the former is 71.3° ; of the latter 47.6° . The highest reading for the year 1886 was 85° ; the lowest 35° . The result would not differ materially had any other town near the coast been taken as an example.

By comparing the mean temperature of several localities widely separated we may be able to judge of the climatic features of Southern California so far as temperature is concerned.

Station.	Location.	June, July, Aug.	Dec. Jan. Feb.
Santa Barbara,	North Coast . . .	65.5°	56.8°
Los Angeles,	Sixteen miles inland . .	66.1	50.0
San Diego,	South Coast . . .	66.3	53.1
San Bernardino,	Sixty miles inland . .	69.0	49.0
Fort Yuma,	Colorado Desert . .	87.1	54.8

A much wider and more interesting comparison is shown in the following table, taken from a physical geography recently published by E. H. Butler & Co., Philadelphia. In this table are shown the comparative summer and winter means of all the principal cities and climatic centres in the United States.

Station.	Locality.	Latitude.	Aver. temp. of June, July, Aug.	Aver. temp. of Dec. Jan. Feb.	Average rainfall in inches.
Sitka, Alaska,	Pacific Slope	57° 03'	54°	35°	102.3
Olympia, W. T.	Pacific Slope	47 02	59	37	69.0
Pembina, Dakota,	Red River Valley	49 00	64	5	21.1
Duluth, Minn.	Lake Region	46 48	65	15	33.4
Portland, O.	Pacific Slope	45 30	65	40	53.5
St. Paul, Minn.	Mississippi Valley	40 53	71	18	29 06
Eastport, Me.	Atlantic Slope	44 55	58	25	48.6
Milwaukee, Wis.	Lake Region	43 03	66	28	34.6
Buffalo, N. Y.	Lake Region	42 53	68	32	37.1
Boston, Mass.	Atlantic Slope	42 23	68	32	50.8
Salt Lake, U. T.	Great Basin	41 10	74	27	18.9
Chicago, Ill.	Lake Region	41 52	73	31	35.3
New York,	Atlantic Slope	40 42	72	37	43.3
Sacramento, Cal.	Pacific Slope	38 35	73	44	22.9
Denver, Col.	Rocky Mountains	39 45	71	39	15.4
Cincinnati, O.	Mississippi Valley	39 06	77	44	42.4
Philadelphia,	Atlantic Slope	39 52	73	36	41.2
Washington, D. C.	Atlantic Slope	38 53	76	42	42.8
San Francisco, Cal.	Pacific Slope	37 47	58	48	23.2
Louisville, Ky.	Mississippi Valley	38 18	77	46	48.4
Lynchburg, Va. .	Atlantic Slope	37 30	77	45	41.8
Los Angeles, Cal.	Pacific Slope	34 03	65	50	17.1
Atlanta, Ga.	Gulf Slope	33 45	77	52	50.3
Yuma, A. T.	Colorado Basin	32 43	88	53	2.7
Vicksburg, Miss.	Mississippi Valley	32 23	80	56	56.7
Savannah, Ga.	Atlantic Slope	32 05	82	58	55.2
San Antonio, Texas,	Gulf Slope	29 28	85	59	31.2
New Orleans, La.	Gulf Slope	29 58	82	61	65.5
Key West, Fl.	Ex. U. S.	24 32	84	73	39.7

At Los Angeles, during the year 1880, the thermometer was as high as 90° only fourteen times. The highest temperature ever recorded at this station is 103°; the lowest 28°. At San Diego the highest ever recorded is 101°; the lowest 32°. Across the divide in the Colorado Desert, however, the heat of summer becomes exceedingly great. A temperature of 120°, or more, lasting for weeks, is no uncommon thing in this region. A temperature of 135° has been recorded at a station on the old southern mail stage road, between Acampo and Yuma. At Yuma, during the year 1880, the temperature exceeded 100° in one hundred and eighteen days, and in twenty-eight of these the mercury rose to 110° and higher.

Although such high temperatures would probably strike one as being unendurable, the contrary is really the case. One may be out of doors in this region when the thermometer stands at 120° with much

more safety than in Chicago or New York with the temperature twenty degrees lower. That this assertion is well founded may be shown from the fact that people who live here go about unconcernedly with a temperature which in a region of summer rains would soon cause its depopulation by sunstroke. Throughout this entire region sunstroke is almost entirely unknown, and the immunity from it depends, not from vigorous health or hardy development, but from the fact that the air is excessively dry.

On the Pacific Slope of Southern California frosts are of rare occurrence. The localities which they are most apt to visit are the low bottom lands along the water courses, the swampy regions, and the high mountain altitudes. They are of greater frequency thirty or forty miles inland than nearer to the coast. There are, however, extensive areas where they never occur at all. Tropical fruits may suffer from other causes, but not from cold.

A word or two concerning clothing may not be amiss in this connection. Although the days of the summer season may be blistering hot, the nights are invariably cool, and the moral to be drawn from this is obvious. No matter what may be the dress for daytime, those going about in the evening require heavy undergarments all the year round. People who have lived here long enough to be judges are almost unanimous in declaring that flannels should always be worn next to the skin. Linen and cotton outer-garments are worn to a much less extent here than in New York, Boston, or Chicago. There are not half a dozen days in the year when a light woollen suit will be uncomfortable; there are many days during the summer season when the temperature demands it. Among the old residents the chief difference between summer and winter dress is a somewhat heavier suit of underwear for the winter season.

The foregoing remarks on temperature point conclusively to one fact which it is well to emphasize particularly: that is, the desirability of Southern California as a summer resort. That this region offers special inducements for winter residents is generally admitted as a matter of fact; however, in nine cases out of ten, more benefit will be derived from the dry salubrious air of the summer months than from the climate of the winter season. During the warm season there is no place, except the immediate coast, where persons of the feeblest constitution cannot camp, or live out of doors for six or seven months in a year, and that with impunity.

It is no uncommon thing for parties to go camping in the mountains, to the mines, to the beach, or to the various mineral springs in which

the country abounds. They eat, live, and sleep, on the ground, enjoying in the meantime the nomadic life, the luxury of which no one can appreciate who has not tasted.

There may be some inconveniences about such living,⁵ but for danger to health not the slightest. And the secret is not warm temperature, but *pure, dry air*, which, after all, is a more effective panacea than was ever put up in the shape of physicians' prescriptions.

SOCIAL SURROUNDINGS.

Whatever may be said of the commercial importance of Southern California, or its future as a great centre of industry, of wealth, and of population, its importance as a sanitary resort cannot be overestimated. Its winters are far milder than those of Florence or Naples, and its summer breezes are not filled with the miasmatic exhalations of the Campagna. More than this, the sufferer who comes here is surrounded, not by a foreign people whose every question is repulsive, but by people of refinement and education, who represent the best social and intellectual conditions to be found anywhere in the United States. Within a radius of one hundred miles are a dozen towns with population varying from three thousand to fifty thousand.

Los Angeles, the commercial centre of this region, is not surpassed by any city in the United States in respect to the conveniences and necessities required either by invalids or by persons of robust health. Five lines of steam railways radiate east, west, north, and south. Cable street cars, electric motors, are laid in the principal thoroughfares, and for three hundred and sixty-five nights in the year the whole city is lighted by electricity. The educational facilities of Southern California are equal to those of any part of the coast, being supplied with every grade of kindergarten, intermediate, grammar, and high schools; and at the head of these stands the University of California with its various colleges and its medical school.

"Within this radius one may find spots four hundred feet below the sea level, or ten thousand feet above it. Spots that have nightly a fog, and localities that never know the presence of a fog; places swept by an almost constant breeze, and others perpetually sheltered from all wind; the odors and gases from petroleum springs, or the air of the mountain pineries; the scent of orange blossoms, or the balsamic odor of the desert. Differences of elevation that elsewhere one may travel a thousand miles to find, here are found within a radius of fifty miles."



